With Ebola in check, are we ready for next outbreak?

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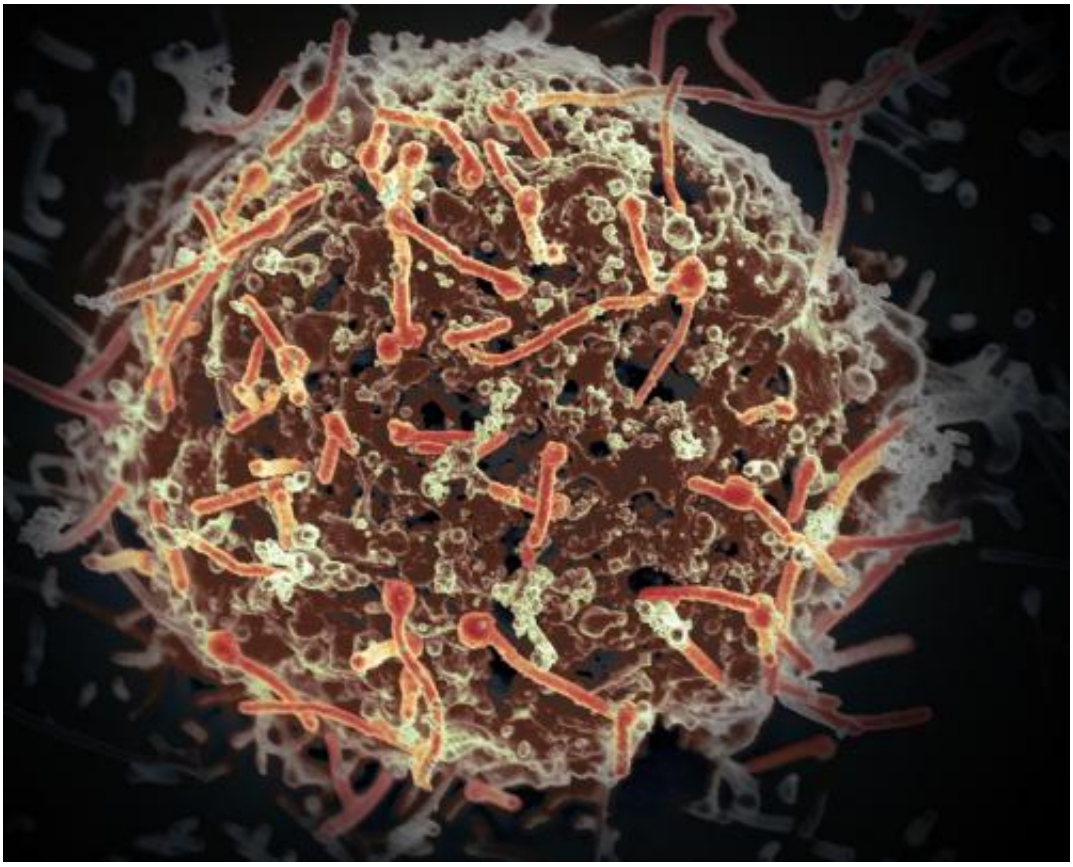

The Ebola virus, isolated in November 2014 from patient blood samples obtained in Mali. The virus was isolated on Vero cells in a BSL-4 suite at Rocky Mountain Laboratories. Credit: NIAID

The world will heave a collective sigh of relief when west Africa's Ebola epidemic is finally declared at an end after claiming more than

11,000 lives over two years.

But with a cure still out of reach, and no vaccine on the market, are we better prepared for next time?

Important lessons were learnt the hard way from the unprecedented devastation and suffering wrought on Liberia, Guinea and Sierra Leone—the countries hardest hit by the outbreak which started in December 2013, say experts.

Epidemiological protocols were improved. At first, many infected people were not quarantined fast enough or given the right type of care.

The World Health Organization's (WHO) much-criticised reaction lag led to an overhaul of epidemic response guidelines. Deployment of medical staff, virus-blocking suits, medicines and other material is likely to happen much faster next time.

"We know how to stop the spread," Liberia's chief medical officer Francis Karteh told AFP. "Liberia is no longer at risk like the way it was."

The WHO is due to declare on Thursday an official end to this outbreak, which infected more than 28,600 people and killed over 11,300.

Before this epidemic, fewer than 2,500 people were known to have been killed by the virus since it was first discovered in 1976.

Lessons learnt

Karteh said local doctors learnt much from organisations such as Medecins Sans Frontieres (MSF or Doctors Without Borders), the Red Cross and the WHO, which deployed staff to help contain the epidemic.

A key lesson was the need for quick, safe and hygienic burials of people who died from the virus transmitted through body fluids, and speedily tracing those who had been in contact with them.

The new knowledge came in handy after Liberia—declared Ebola-free—had two further flare-ups, successfully stopped in their tracks.

"During the first outbreak our doctors and healthcare workers were not (familiar with) the disease," said Karteh.

"This is why a good number of them (more than 500) died."

An ironic upside of the outbreak's massive scale is that it yielded thousands of survivors for medical research.

This led to the discovery that Ebola virus can live for several months in the semen, spinal column and eye fluid of survivors—though the implications and transmission risk are not yet clear.

It was also recently found that survivors can suffer vision problems, hearing loss and joint pain for months after being declared cured.

Scramble for drugs

The scale of the outbreak, and the global scare caused when infected doctors started returning home from west Africa to Europe and the United States, provided impetus for the fast-track development of drugs.

The resulting pharmaceutical scramble yielded several promising vaccine candidates.

But none have yet been tested in general, non-infected populations—the gold standard for proving efficacy.

Similarly, none of the many potential treatments under investigation have so far been proven to work.

Many drug studies started when the epidemic was already declining and there were no longer enough patients for clinical trials.

Nevertheless, many studies have advanced to the point that testing can continue if there is another outbreak.

The frontrunners are ZMapp, a cocktail of three artificial Ebola antibodies made by Mapp Biopharmaceutical in California and Avigan, an antiviral tablet developed by a subsidiary of Japan's Fujifilm Holdings.

Both were given to infected medical workers, though it is not sure that their survival was due to the treatment.

A lesser-known compound called GS-5734, developed by US-based Gilead Sciences, was given to a Scottish nurse hospitalised with a serious relapse months after her initial recovery. She recovered.

Some treatments did not pan out.

A study released last week concluded that transfusions of blood plasma from survivors—despite sky-high expectations—failed to significantly increase the odds of recovery.

On the upside, doctors recently said a malaria drug given to Ebola patients in Liberia seemed to improve chances for survival.

For now, the focus remains rapid response, speedy quarantine, and quality care—including intravenous drip to prevent dehydration—for those infected.

"We learnt a lot during this epidemic," said Michel Van Herp of MSF. "The next epidemic will not be as dramatic."

Jean-Francois Delfraissy, French immunologist, said keeping an eye on survivors, and boosting African early alert systems, were crucial to breaking the transmission chain.

"Continued research into vaccines, treatments and the virus reservoir, both animal and human, is indispensible," he said.

Ebola: profile of a prolific killer

This is a factfile on Ebola ahead of Liberia's expected announcement this week that it is officially free of Ebola transmission, bringing an end to the worst ever outbreak of the disease in West Africa.

Toll

The outbreak started in December 2013 in southern Guinea before spreading to two neighbouring west African countries. It has killed more than 11,300 people, out of 29,000 registered cases, according to World Health Organization (WHO) estimates.

The real figure may be significantly higher. More than 99 percent of the victims were based in three neighbouring nations—Guinea (more than 2,500 dead), Sierra Leone (more than 3,900) and Liberia (more than 4,800).

Origins

Ebola was first identified in central Africa. The tropical virus was named after a river in the Democratic Republic of Congo—then known as

Zaire—where it came to light in 1976.

Five species have been identified to date (Zaire, Sudan, Bundibugyo, Reston and Tai Forest), the first being historically the most virulent with death rates that have reached 90 percent among humans.

Transmitting Ebola

The virus's natural reservoir animal is probably the bat, which does not contract the disease itself. Chimpanzees, gorillas, monkeys, forest antelope and porcupines are also suspected of having transmitted Ebola to humans.

Only one certified contact with an animal has been recorded in the current outbreak. It has since been passed among humans. Ebola is transmitted by contact with the blood, body fluids, secretions or organs of an infected or recently deceased person, but not by air.

Those infected do not become contagious until the symptoms appear. They then become more and more contagious until just after their death, which poses great risks during funerals.

The symptoms

Following an incubation period of between two and 21 days, Ebola develops into a high fever, weakness, intense muscle and joint pain, headaches and sore throats.

That is often followed by vomiting and diarrhoea, skin eruptions, kidney and liver failure, and internal and external bleeding.

Avoiding infection

In the absence of a confirmed vaccine or cure, it is recommended that preventive measures be taken to stop the spread of Ebola—notably through hand-washing and using gel or alcohol-based disinfectants.

A distance of several metres (yards) should also be kept from infected people or bodies, and healthcare providers must wear disposable protective clothing that includes masks and gloves.

Possible treatments

Several tests have been carried out with experimental drugs and vaccines during the epidemic in west Africa. Among these are Avigan (favipiravir), an antiviral treatment being developed by the Japanese company Toyama Chemical.

The best known is ZMapp, a cocktail of three monoclonal (single cell) antibiotics developed through a Canadian/US partnership.

The WHO said in July that the world "is on the verge of an effective Ebola vaccine" after Canadian drug VSV-EZEBOV was found in clinical trials in Guinea to provide 100-percent protection from the disease. The drug may therefore become the first licensed vaccine against the disease.